



P-DUKE POWER

MAH240 Series

3 X 5 Inch AC-DC POWER SUPPLIES
Peak Power up to 300 Watts

5
YEARS
WARRANTY

ROHS
COMPLIANT

REACH
COMPLIANT

+85°C
-40°C
AMBIENT TEMP.



Medical



Automation



Datacom



IPC



Industry



Measurement



Telecom



Automobile



Boat



Charger



PV



Railway



PEAK
POWER

2
X
MOPP

4000
VAC
Reinforced
Insulation

ADJ.
Output
Voltage

Internal
EN55032
Class **B**
Filter

LOW
Leakage
Current

NO
Min. Load
Required

Operating
Altitude
5000
meter

Protection
Class I
Class II

REMOTE
ON
OFF

OCP

OVP

SCP

OTP

PART NUMBER STRUCTURE

MAH240	U	S	12	A	-	M			
Series Name	Universal Input (VAC)	Output Quantity	Output Voltage (VDC)	Protection Type	Connector Options	Package Options	Fan Control Options	Remote On/Off Options	
	85~264	Single	12:12 15:15 24:24 28:28 36:36 48:48 54:54	A: CLASS I B: CLASS II	M: Molex J: JST T: Terminal Block	☐ : Open type	☐ : None F3: No External FAN with fixed fan speed control	☐ : None L: Remote On/Off	

TECHNICAL SPECIFICATION All specifications are typical at 230VAC input,nominal power full load and 25°C unless otherwise noted

Model Number	Input Range	Output Voltage	Output Current		Output Power		Efficiency	Maximum Capacitor Load
			Forced Air Cooling With 10 CFM @Full Load	Max. Peak Power	Output Power @Full Load	Max. Peak Power		
			A	A	W	W		
MAH240US12A-M	85 ~ 264	12	20	25	240	300	90	10000
MAH240US15A-M	85 ~ 264	15	16	20	240	300	90	6800
MAH240US24A-M	85 ~ 264	24	10	12.5	240	300	90	2400
MAH240US28A-M	85 ~ 264	28	8.58	10.72	240	300	90	2000
MAH240US36A-M	85 ~ 264	36	6.67	8.34	240	300	90	1200
MAH240US48A-M	85 ~ 264	48	5	6.25	240	300	91	680
MAH240US54A-M	85 ~ 264	54	4.45	5.56	240	300	91	680

INPUT SPECIFICATIONS						
Parameter	Conditions		Min.	Typ.	Max.	Unit
Operating input voltage range	AC input	Peak voltage 300Vac 5Sec (Max.) of Nominal Full Load	85		264	VAC
	DC input		88		370	VDC
Input frequency	AC input		47		63	Hz
Input current	100VAC and at 240W Full Load				3.8	A
	240VAC and at 240W Full Load				1.5	
No load input power	230VAC	Option "-F3" (with Fan)			3	Watts
		Without Fan			0.3	
Leakage current	264VAC			100		μA
Power factor			0.95			
Start up time					1500	ms
Rise time				20		ms
Hold up time	115VAC and at Full Load		25			ms
Input inrush current	230VAC	cold start at 25°C		80		A
Input protection	Internal fuse			T5.0A/300VAC		

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output nominal power	Forced air cooling @ 230VAC Natural convection @ 230VAC * Please refer to the derating curve for detailed rating. * For further information, please contact with P-DUKE.			240 180	Watts
Output peak power	Peak power Peak power time Peak power duty Average operation power (% of Nominal Full Load) * Please refer to the Definition of peak power rating. * For further information, please contact with P-DUKE.		80	300 10 20	Watts s %
Initial set voltage accuracy	230VAC and Full Load	-1.0		+1.0	%
Line regulation	Low Line to High Line at Full Load	-0.2		+0.2	%
Load regulation	No Load to Full Load 10% Load to 90% Load	-0.5 -0.4		+0.5 +0.4	%
Voltage adjustability	12 ~ 48Vout 54Vout	-10 -20		+10 0	%
Minimum load	No minimum load required		0		%
Ripple and noise	Measured by 20MHz bandwidth With a 10 μ F/25V 1206 X7R MLCC 12Vout 15Vout With a 1 μ F/50V 1206 X7R MLCC 24Vout 28Vout 36Vout With a 1 μ F/100V 1206 X7R MLCC 48Vout 54Vout		120 150 240 280 360 480 540		mVp-p
Temperature coefficient		-0.02		+0.02	%/°C
Transient response	Load step from 100 ~ 75% change at 2.5A/ μ s Peak deviation Recovery time		3 1000		% Vout μ s
Over voltage protection	% of Vout(nom) 12 ~ 36Vout 48Vout, 54Vout Latch mode Latch mode		130	59.5	% VDC
Over load protection	% of Iout rated; Hiccup mode		180		%
Short circuit protection	Output short circuit is defined to be a short circuit load of less than 0.1 ohm	Continuous, automatic recovery			
Remote ON/OFF (Option "-L" suffix)	External power supply is required Between +Ctrl and -Ctrl	Output OFF Output ON Input current	0 ~ 0.8 VDC or Open 4.5 ~ 12.5 VDC 20 mA		
Fan power supply (Option "-F3" suffix)			12V / 300mA		

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Isolation voltage	1 minute (2MOPP insulation) Input to Output Input (Output) to F.G.	4000 2500			VAC
Isolation resistance	500VDC	0.1			G Ω
Switching frequency	230VAC, Full load		60		kHz
Safety meets		IEC/ EN/ ANSI/AAMI ES 60601-1 IEC/ EN/ UL 62368-1			
Weight				340g (11.99oz)	
MTBF	MIL-HDBK-217F Ta=25°C, Full load			7.252 x 10 ⁵ hrs	

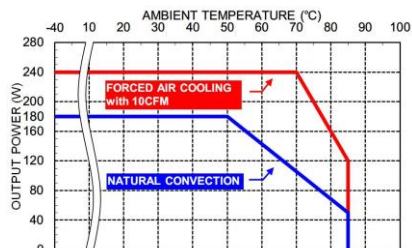
ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+85	°C
Storage temperature range		-40		+85	°C
Operating altitude				5000	m
Thermal shock				MIL-STD-810F	
Shock				IEC60068-2-27	
Vibration				IEC60068-2-6	
Relative humidity	Non-condensing			5% to 95% RH	

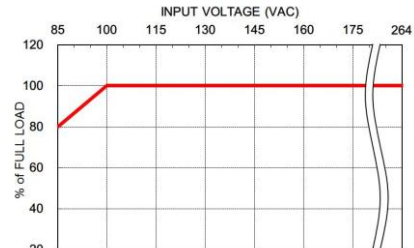
EMC SPECIFICATIONS

Parameter	Conditions	Level
EMI	EN55011, EN55032, EN60601-1-2 and FCC Part 18 / 15	Conducted Radiated Class B Class B
Harmonic currents	EN61000-3-2 Full Load	Class D
Voltage flicker	EN61000-3-3	
EMS	EN55035 and EN60601-1-2	
ESD	EN61000-4-2	Perf. Criteria A
Radiated immunity	EN61000-4-3 20 V/m	Perf. Criteria A
Fast transient	EN61000-4-4 ± 2kV	Perf. Criteria A
Surge	EN61000-4-5 DM ± 1kV and CM ± 2kV	Perf. Criteria A
Conducted immunity	EN61000-4-6 20 Vr.m.s	Perf. Criteria A
Power frequency magnetic field	EN61000-4-8 30A/m	Perf. Criteria A
Dip and interruptions	EN61000-4-11	

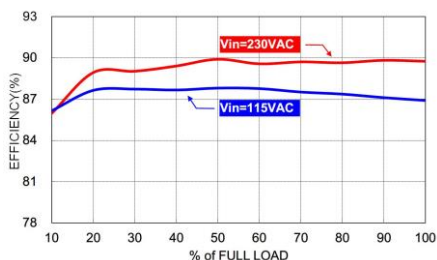
CHARACTERISTIC CURVE



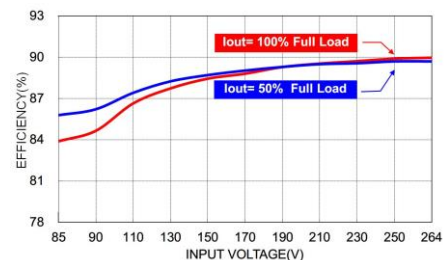
Derating Curve vs. Ambient Temperature
Vin=230VAC Open type



Derating Curve vs. Input Voltage



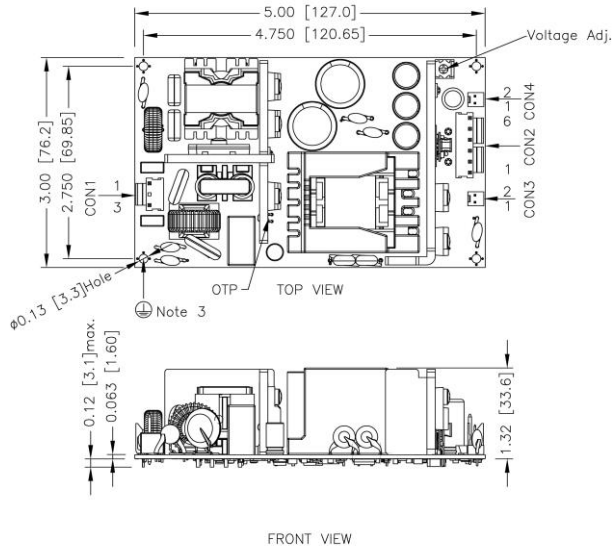
MAH240US24 Efficiency vs. Output Load



MAH240US24 Efficiency vs. Input Voltage

MECHANICAL DRAWING

Open type: option "- M" & "- J" suffix



1. All dimensions in inch [mm]
Tolerance : $x.xx \pm 0.02$ [$x.x \pm 0.5$]
 $x.xxx \pm 0.01$ [$x.xx \pm 0.25$]
2. The screw locked torque: MAX 3.4Kgf.cm/0.33N.m
3. The screws holes can be considered as PE connection for CLASS I application

CONNECTORS CONNECTIONS

CON1 – Input Connector		
Pin Number	AC Input	DC Input
Pin 1	Neutral	DC-
Pin 3	Line	DC+

CON2 – Output Connector	
Pin 1	-Vout
Pin 2	-Vout
Pin 3	-Vout
Pin 4	+Vout
Pin 5	+Vout
Pin 6	+Vout

CON3 – Remote ON/OFF Connector	
Pin 1	-Ctrl
Pin 2	+Ctrl

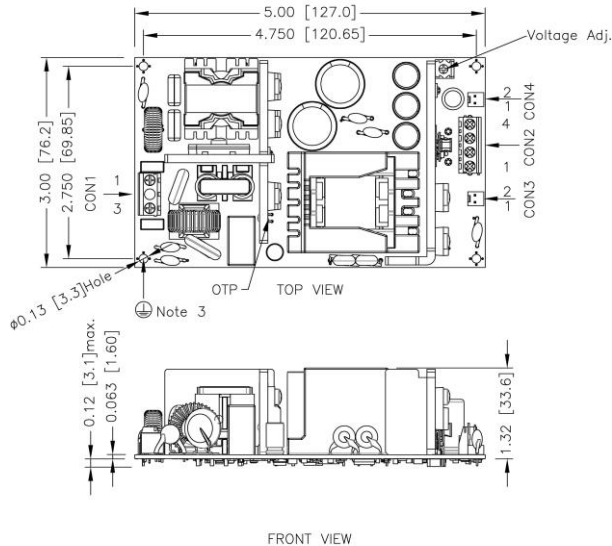
Mates with
Molex housing : **22-01-1022**
Molex crimp terminals : **2759**
* Remote ON/OFF control (CON3) function is available as option "-L" suffix.

CON4 – Fan Control Connector	
Pin 1	-Fan
Pin 2	+Fan

Mates with
Molex housing : **22-01-1022**
Molex crimp terminals : **2759**
* Fan power supply control (CON4) function is available as option "-F3" suffix.

MECHANICAL DRAWING

Open type: option "- T" suffix



1. All dimensions in inch [mm]
Tolerance : x.xx±0.02 [x.x±0.5]
x.xxx±0.01 [x.xx±0.25]
2. The screw locked torque: MAX 3.4Kgf.cm/0.33N.m
3. The screws holes can be considered as PE connection for CLASS I application

CONNECTORS CONNECTIONS

CON1 – Input Connector			CON2 – Output Connector		CON3 – Remote ON/OFF Connector		CON4 – Fan Control Connector	
Pin Number	AC Input	DC Input	Pin 1	-Vout	Pin 1	-Ctrl	Pin 1	-Fan
Pin 1	Neutral	DC-	Pin 2	-Vout	Pin 2	+Ctrl	Pin 2	+Fan
Pin 3	Line	DC+	Pin 3	+Vout				
			Pin 4	+Vout				

Mates with
Molex housing : **22-01-1022**
Molex crimp terminals : **2759**
* Remote ON/OFF control (CON3) function is available as option "-L" suffix.

Mates with
Molex housing : **22-01-1022**
Molex crimp terminals : **2759**
* Fan power supply control (CON4) function is available as option "-F3" suffix.

CONNECTOR OPTIONS

-M	Molex Type	-J	JST Type	-T	Terminal Block
	Mates with housing CON1: 09-93-0300 CON2: 09-93-0600 Crimp terminals CON1: 2478 CON2: 2478		Mates with housing CON1: VHR-3N CON2: VHR-6N Crimp terminals CON1: SVH-21T-P1.1 CON2: SVH-21T-P1.1		Mates with Screw locked torque MAX 2.5Kgf.cm/0.25N.m Wire dimension range 24 ~ 14AWG
	Barrier Terminal Block				
	Mates with CON2: KST ring terminal RVS2-4 Screw locked torque: MAX 16.8Kgf.cm/1.65N.m Note: For further information, please contact with P-DUKE.				